

---

# Contents

<b>Introduction</b> . . . . .	ix
János Haas	
<b>History of Geologic Research</b> . . . . .	xi
János Haas	
<b>Geography and Outline of Geologic Framework</b> . . . . .	xvii
János Haas	
<b>Structural Units and Main Stages of the Structural Evolution</b> . . . . .	xxi
János Haas	
<b>1 Geology and History of Evolution of the ALCAPA Mega-Unit</b>	1
1.1 Austroalpine Units . . . . .	1
Tibor Szederkényi	
1.1.1 Lower Austroalpine Nappe System . . . . .	1
1.1.2 Upper Austroalpine Nappe System . . . . .	6
1.1.3 Penninic Unit . . . . .	6
1.2 Central and Internal Western Carpathian Units . . . . .	9
Sándor Kovács and János Haas	
1.2.1 Veporic Unit . . . . .	9
1.2.2 Zemplénc Unit . . . . .	10
1.2.3 Internal Western Carpathian Nappe-Stack . . . . .	11
1.2.3.1 Bódva Nappe . . . . .	12
1.2.3.2 Torna Nappe . . . . .	14
1.2.3.3 Telekesoldal Nappe . . . . .	15
1.2.3.4 Szőlősardó Unit . . . . .	16
1.2.3.5 Silica–Aggtelek Nappe . . . . .	17
1.3 Pelso Composite Unit . . . . .	21
János Haas and Sándor Kovács	
1.3.1 Transdanubian Range Unit . . . . .	21
1.3.1.1 Variscan Evolutionary Cycle . . . . .	22
1.3.1.2 Alpine Evolutionary Cycle . . . . .	25
1.3.2 Mid-Transdanubian Unit . . . . .	56
1.3.2.1 South Karavank Unit . . . . .	56
1.3.2.2 Julian–Savinja Unit . . . . .	57
1.3.2.3 South Zala and Kalnik Units . . . . .	57

1.3.3	Bükk Composite Unit . . . . .	58
1.3.3.1	Bükk Unit ss . . . . .	59
1.3.3.2	Szendró Unit . . . . .	73
1.3.3.3	Uppony Unit . . . . .	76
1.4	Accretion of the ALCAPA Mega-Unit . . . . .	81
	András Nagymarosy	
1.4.1	Paratethys Evolution and Its Consequences for the Palaeogene–Neogene Chronostratigraphic Framework . . . . .	81
1.4.2	Hungarian Palaeogene Basin . . . . .	83
1.4.2.1	General Trends of Evolution and Palaeogeography . . . . .	84
1.4.2.2	Eocene . . . . .	84
1.4.2.3	Oligocene . . . . .	91
1.4.2.4	Late Egerian-Eggenburgian-Earliest Ottngian . . . . .	95
1.4.2.5	Igneous Activity During the Paleogene- Eggenburgian . . . . .	99
<b>2</b>	<b>Geology and History of Evolution of the Tisza Mega-Unit . . . .</b>	<b>103</b>
2.1	Pre-Variscan to Variscan Evolution . . . . .	103
	Tibor Szederkényi	
2.1.1	Crystalline Complexes . . . . .	104
2.1.2	Lithostratigraphy of the Tectono-stratigraphic Units and Tectono-metamorphic Evolution . . . . .	105
2.1.2.1	Slavonia–Drava Unit . . . . .	105
2.1.2.2	Kunság Unit . . . . .	106
2.1.2.3	Békés Unit . . . . .	108
2.1.2.4	Outliers . . . . .	109
2.1.3	Protoliths and Polymetamorphic Deformations . . . . .	111
2.1.4	Tectono-metamorphic Events . . . . .	112
2.2	Post-Variscan Evolution . . . . .	113
	Tibor Szederkényi	
2.2.1	Late Carboniferous–Permian Continental Formations . . . . .	113
2.2.2	Late Carboniferous–Permian Cover of the Slavonia–Drava Unit . . . . .	113
2.2.3	Permian Cover of the Kunság Unit . . . . .	117
2.2.4	Permian Cover of the Békés–Codru Unit . . . . .	118
2.3	Alpine Evolution . . . . .	118
	János Haas	
2.3.1	Fluvial Sedimentation in the Early Triassic . . . . .	119
2.3.2	Transgression in the Anisian – Siliciclastic Ramp Sedimentation . . . . .	120

2.3.3	Shallow Carbonate Ramp Evolution in the Middle Triassic . . . . .	122
2.3.4	Differentiation of the Facies Zones of the Tisza Mega-Unit . . . . .	124
2.3.5	Mecsek Facies Unit . . . . .	124
2.3.5.1	Intensification of Continental Input in the Late Triassic . . . . .	124
2.3.5.2	Coastal Swamp and Shallow Marine Siliciclastic Ramp in the Early Liassic . . . . .	125
2.3.5.3	Pelagic Marl Facies in the Middle Liassic to Early Dogger Interval . . . . .	127
2.3.5.4	Siliceous and Carbonate Deep-Sea Facies in the Late Dogger to Malm Interval . . . . .	128
2.3.5.5	Basaltic Magmatism in the Early Cretaceous . . . . .	129
2.3.5.6	Tectogenic Episodes and Flexural Basins in the Late Cretaceous . . . . .	130
2.3.5.7	Palaeogene Flysch Deposition in the “Szolnok Flysch Trough” . . . . .	131
	András Nagymarosy	
2.3.5.8	Continental Palaeogene Basin in the Mecsek . . . . .	137
	András Nagymarosy	
2.3.6	Villány–Bihar Facies Unit . . . . .	137
2.3.6.1	Coastal–Terrestrial Sedimentation in the Late Triassic . . . . .	137
2.3.6.2	Discontinuous Shallow Marine Deposition in the Jurassic . . . . .	138
2.3.6.3	Carbonate Platform Development in the Early–Middle Cretaceous . . . . .	138
2.3.6.4	Pelagic Basin Formation at the End of the Mid-Cretaceous . . . . .	140
2.3.6.5	Senonian Basin Evolution . . . . .	141
2.3.7	Békés–Codru Facies Unit . . . . .	142
2.4	Regional Geological Cross-sections . . . . .	142
	János Haas and Géza Hámor	
<b>3</b>	<b>Genesis and Evolution of the Pannonian Basin . . . . .</b>	<b>149</b>
	András Nagymarosy and Géza Hámor	
3.1	Concept of the Pannonian Basin . . . . .	149
3.1.1	Subsidence History and Tectonics of the Pannonian Basin . . . . .	151
3.1.2	Stratigraphic Considerations . . . . .	155
3.2	Early Miocene . . . . .	156
3.2.1	Post-Eggenburgian Early Miocene Formations in the ALCAPA Mega-Unit . . . . .	156
3.2.2	Ottningian Formations . . . . .	159
3.2.2.1	Continental Formations, North Hungary . . . . .	159

3.2.2.2	Brackish to Marine Formations, North Hungary . . . . .	159
3.2.2.3	Marine Formations, Várpalota Basin . . . . .	160
3.2.3	Karpatian Formations . . . . .	161
3.2.3.1	Northwest Hungary . . . . .	161
3.2.3.2	Northeast Hungary . . . . .	162
3.2.4	Early Miocene Formations in the Tisza Mega-Unit . . . . .	163
3.2.5	Igneous Formations in the Early Miocene . . . . .	166
3.3	Middle Miocene . . . . .	168
3.3.1	Formations of Large Lateral Extension . . . . .	170
3.3.1.1	Badenian Formations . . . . .	171
3.3.1.2	Sarmatian Formations . . . . .	172
3.3.2	Regional Units . . . . .	173
3.3.2.1	Sopron Mountains . . . . .	173
3.3.2.2	Little Hungarian Plain . . . . .	174
3.3.2.3	Transdanubian Range . . . . .	174
3.3.2.4	Northern Hungary (North Hungarian Range) . . . . .	176
3.3.2.5	Mecsek Mountains and Southeast Hungary . . . . .	177
3.3.2.6	Zala and Drava Basins . . . . .	180
3.3.2.7	Basins in the Great Hungarian Plain . . . . .	181
3.3.3	Igneous Activity in the Middle Miocene . . . . .	182
3.4	Late Miocene and Pliocene . . . . .	186
3.4.1	Late Miocene or Pannonian . . . . .	186
3.4.1.1	Marginal Sequences . . . . .	191
3.4.1.2	Sequences of the Deep Basins . . . . .	194
3.4.2	Pliocene . . . . .	197
3.4.3	Volcanic Activity in the Late Miocene-Pliocene . . . . .	198
<b>4</b>	<b>Quaternary Evolution . . . . .</b>	<b>201</b>
	Áron Jámbor	
4.1	Significance of the Quaternary Formations . . . . .	201
4.2	History of Quaternary Research in Hungary . . . . .	202
4.3	Major Characteristics of the Quaternary Depositional Areas . . . . .	204
4.4	Volcanism . . . . .	211
4.5	Tectonics . . . . .	211
4.6	Present-Day Soils . . . . .	211
4.7	History of Evolution . . . . .	212
	<b>References . . . . .</b>	<b>215</b>
	<b>Index . . . . .</b>	<b>239</b>



<http://www.springer.com/978-3-642-21909-2>

Geology of Hungary

Haas, J. (Ed.)

2013, XXII, 246 p., Hardcover

ISBN: 978-3-642-21909-2